IN THE CLAIMS:

1. (Currently amended) A method for repairing a coated component, which has been exposed to engine operation, to restore coated dimensions of the component and increase subsequent engine operation efficiency, comprising:

a) providing an engine run component including a base metal substrate having thereon a thermal barrier coating system, the thermal barrier coating system comprising a bond coat on the base metal substrate and a top ceramic thermal barrier coating, the top ceramic thermal barrier coating having a nominal thickness t; wherein the component including the bond coat thereon before engine operation has a weight, w_0, and the component including the bond coat and the top thermal barrier coating thereon before engine operation has a weight, w_1;

b) removing completely the thermal barrier coating system, wherein a portion of the base metal substrate also is removed, and determining thickness of the base metal substrate removed, the portion of the base metal substrate removed having a thickness, Δt; wherein the component has a weight, w_2, after removal of the thermal barrier coating and before removal of the bond coat; and the component has a weight, w_3, after complete removal of the thermal barrier coating system;

c) reapplying ~~a~~ the bond coat to the substrate at a thickness which is about the same as the thickness applied prior to the engine operation; wherein after application of the bond coat the component is weighed, denoted by w_4, to determine a weight margin remaining, wherein a combination of at least two of w_0, w_1, w_2, w_3 and w_4 is employed to determine the amount of removed base metal and calculate a thickness in which to apply a top ceramic thermal barrier coating without incurring a weight penalty;

d) reapplying a top ceramic thermal barrier coating to a nominal thickness of $t+\Delta t$, wherein Δt compensates for the portion of base metal substrate removed in b) to restore adjacent airfoil to airfoil throat distance to about the distance preceding the engine run so that, ~~and~~ the dimensions of the coated component are restored to about the coated dimensions preceding the engine run to increase subsequent engine operation efficiency, wherein the thermal barrier coating of d) is applied at a thickness greater than the thermal barrier coating a); and weight of the component having the bond coat of c) and the thermal barrier coating of d) thereon is denoted by w_5, wherein w_5 is less than w_1.

2. (Original) The method of claim 1, wherein the engine run component is a high pressure turbine blade, and coated airfoil contour dimensions of the coated component are restored.

3. (Canceled)

4. (Original) The method of claim 1, wherein t is between about 3 mils and about 10 mils, and Δt is at least about 1 mil.

5. (Original) The method of claim 1, wherein the bond coat of a) and c) comprises a diffusion aluminide coating.

6. (Original) The method of claim 5, wherein the diffusion aluminide coating is a simple aluminide or a modified aluminide.

7. (Original) The method of claim 1, wherein the base metal substrate is a nickel-based single crystal superalloy.

8. (Original) The method of claim 1, wherein the base metal substrate is a nickel-based directionally solidified superalloy.

9. (Original) The method of claim 5, wherein the diffusion aluminide coating is a modified aluminide coating comprising a metal selected from the group consisting of Pt, Rh and Pd.

10. (Original) The method of claim 5, wherein the diffusion aluminide coating further comprising reactive elements.

11. (Original) The method of claim 1, wherein the ceramic thermal barrier coating comprising yttria stabilized with zirconia.

12. (Currently amended) The method of claim 1, wherein the bond coat of a) and c) comprises a MCrAlY coating, wherein M is selected from the group consisting of iron, cobalt, nickel and mixtures thereof.

13. (Currently amended) A method for repairing a coated high pressure turbine blade, which has been exposed to engine operation, to restore airfoil contour dimensions of the blade comprising:

a) providing an engine run high pressure turbine blade including a base metal substrate made of a nickel-based alloy having thereon a thermal barrier coating system, the thermal barrier coating system comprising a diffusion bond coat on the base metal substrate and a top ceramic thermal barrier coating comprising a yttria stabilized zirconia material, the top ceramic thermal barrier coating having a nominal thickness t; wherein the component including the bond coat thereon before engine operation has a weight, w_0, and the component including the bond coat and the top thermal barrier coating thereon before engine operation has a weight, w_1;

b) removing completely the thermal barrier coating system, wherein a portion of the base metal substrate also is removed, and determining thickness of the base metal substrate removed, the portion of the base metal substrate removed having a thickness, Δt; wherein the component has a weight, w_2, after removal of the thermal barrier coating and before removal of the bond coat; and the component has a weight, w_3, after complete removal of the thermal barrier coating system;

c) reapplying the diffusion bond coat to the substrate, wherein the bond coat is reapplied to a thickness, which is about the same as applied prior to the engine operation; wherein after application of the bond coat the component is weighed, denoted by w_4, to determine a weight margin remaining, wherein a combination of at least two of w_0, w_1, w_2, w_3 and w_4 is employed to determine the amount of removed base metal and calculate a thickness in which to apply a top ceramic thermal barrier coating without incurring a weight penalty;

d) reapplying the top ceramic thermal barrier coating to a nominal thickness of $t+\Delta t$, wherein Δt compensates for the portion of base metal substrate removed in b) to restore airfoil to airfoil throat distance to about that preceding the engine run so that, ~~and~~ the coated airfoil contour dimensions are restored to about the coated dimensions preceding the engine run, wherein the thermal barrier coating of d) is applied at a thickness greater than the thermal barrier coating a); and weight of the component having the bond coat of c) and the thermal barrier coating of d) thereon is denoted by w_5, wherein w_5 is less than w_1..

14. (Original) The method of claim 13, wherein the nickel-based alloy has a density of about

8.64 g/cm^3.

15. (Original) The method of claim 13, wherein the yttria stabilized zirconia material has a density of about 4.7 g/cm^3.

16. (Original) The method of claim 1, wherein the component is an airfoil.

17. (Original) The method of claim 1, wherein the component is a static component.

18. (Original) The method of claim 17, wherein the static component is a vane.

19. (Currently amended) A method for repairing a coated component, which has been exposed to engine operation, to restore coated airfoil contour dimensions of the component comprising:

a) providing an engine run component including a base metal substrate made of a nickel-based alloy having thereon a thermal barrier coating system, the thermal barrier coating system comprising a diffusion bond coat on the base metal substrate and a top ceramic thermal barrier coating comprising a yttria stabilized zirconia material, the top ceramic thermal barrier coating having a nominal thickness t; wherein the component including the bond coat thereon before engine operation has a weight, w_0, and the component including the bond coat and the top thermal barrier coating thereon before engine operation has a weight, w_1;

b) inspecting the component;

c) removing completely the thermal barrier coating system by stripping, wherein a portion of the base metal substrate also is removed, the portion of the base metal substrate removed having a thickness, Δt; wherein the component has a weight, w_2, after removal of the thermal barrier coating and before removal of the bond coat; and the component has a weight, w_3, after complete removal of the thermal barrier coating system;

d) reapplying the diffusion bond coat to the substrate, wherein the bond coat is reapplied to a thickness, which is about the same as applied prior to the engine operation, followed by weighing the component to calculate Δt; wherein after application of the bond coat the component is weighed, denoted by w_4, to determine a weight margin remaining, wherein a combination of at least two of w_0, w_1, w_2, w_3 and w_4 is employed to determine the

amount of removed base metal and calculate a thickness in which to apply a top ceramic thermal barrier coating without incurring a weight penalty;

and

e) reapplying the top ceramic thermal barrier coating to a nominal thickness of $t+\Delta t$, wherein Δt compensates for the portion of base metal substrate removed in b) to restore adjacent airfoil to airfoil throat distance to about the distance preceding the engine run so that ~~, and~~ the airfoil contour dimensions of the coated component are restored to about the coated dimensions preceding the engine run, wherein the thermal barrier coating of e) is applied at a thickness greater than the thermal barrier coating a); and weight of the component having the bond coat of d) and the thermal barrier coating of e) thereon is denoted by w_5, wherein w_5 is less than w_1.